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## Low Cost / Low Profile Spring Probe

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### INTRODUCTION

#### Why One Piece Spring Probes ?

- Most innovative method to make Spring probes by progressive stamping
- Best solution for Mass production/Quality management/Extremely low cost
- Simple metal strip becomes many fully assembled spring probes in a second
- No additional part supply is needed !!!

### DESIGN CONSIDERATION

#### 1. Selection of tip shape



4 sharp tips



2 round tips

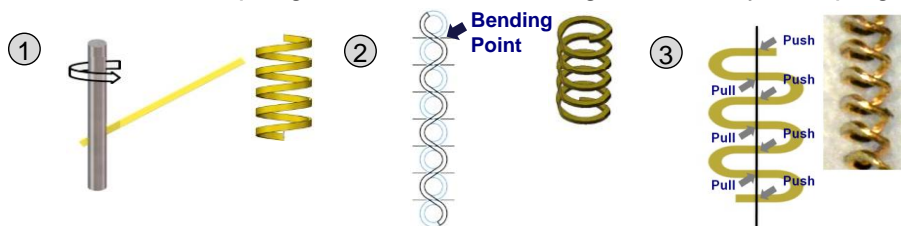


cone tip



spear head

#### 2. Selection of coil spring: A few manufacturing methods by stamping

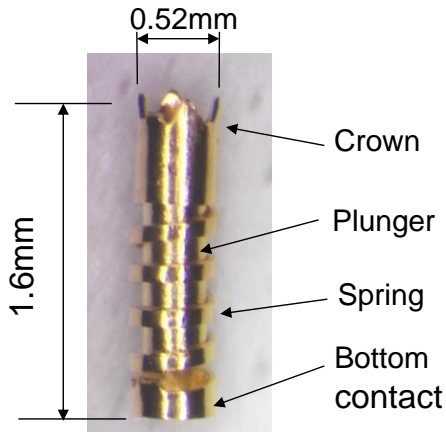


#### 3. Selection of body structure: Various types of intricate body shapes

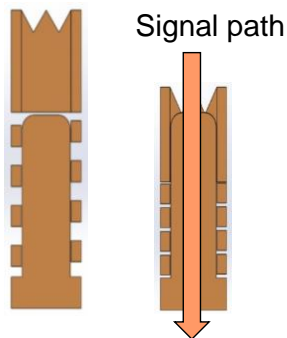




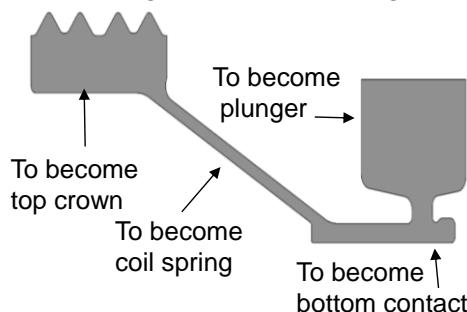
## One piece spring probe Case study - Low cost version PPSP



- Material used C1720 BeCu
- Spring force 10 grams
- Stroke 0.38 mm
- Cres 38 milliohm
- Current carrying 3 ampere

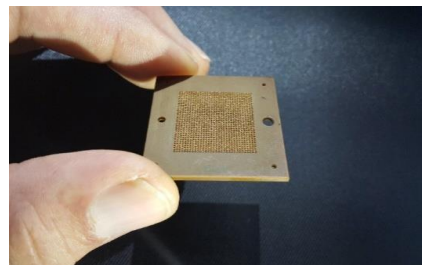


### Planer figure for stamping



Fully assembled pin attached to the reel

- Can control very tight dimensional tolerance
- Crown shape, Spring force and spring diameter can be optional
- Very productive/low cost method to make spring probe for good volume



One piece spring probes assembled to one piece socket body

## One piece spring probe Case study Low cost version PPSP



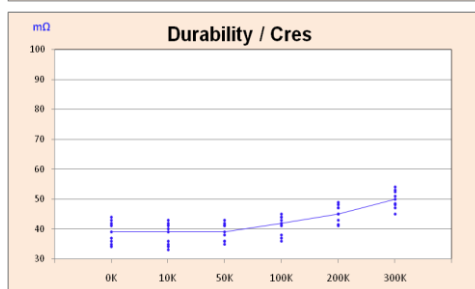
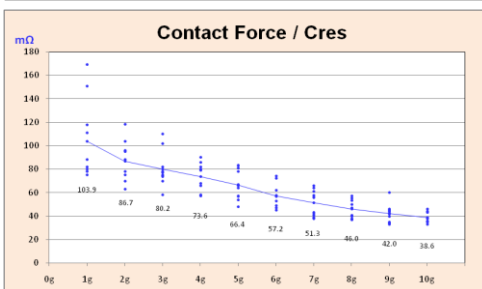
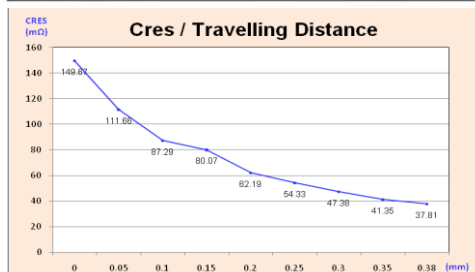
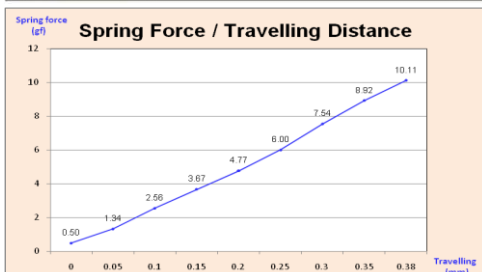
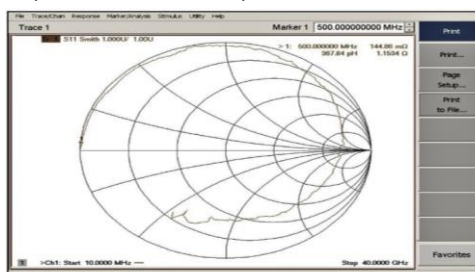
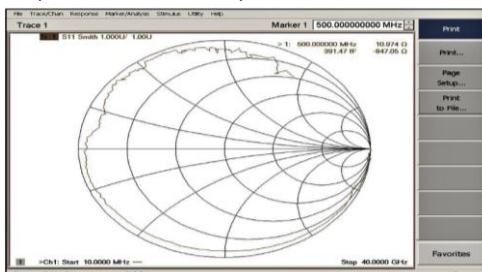
**Insertion Loss:**

-1dB @ 17 GHz , -3dB @ 39 GHz

**Return Loss:**

-20dB @ 5 GHz, -10dB @ 15 GHz

- Capacitance : 0.391pF @ 500 MHz GSG - Inductance : 0.368nH @ 500 MHz GSG  
open circuit 0.65 mm pitch open circuit, 0.65 mm pitch



### Summary and the next steps

1. Incredibly high speed parts/minute production by stamping
2. Test height can be reduced to 0.8 mm and Cres 20 milliohm – LCC being verified
3. Relatively easier quality management once stamping tool is qualified.
4. Extremely low cost pin for high volume application
5. Reduce lead time for stamping tool for a new pin development